

# **Downscaling MODIS Land Surface Temperature for Urban Public Health Applications**

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This study is part of a project funded by the NASA Applied Sciences Public Health Program, which focuses on Earth science applications of remote sensing data for enhancing public health decision-making. Heat related death is currently the number one weather-related killer in the United States. Mortality from these events is expected to increase as a function of climate change. This activity sought to augment current Heat Watch/Warning Systems (HWWS) with NASA remotely sensed data, and models used in conjunction with socioeconomic and heat-related mortality data. The current HWWS do not take into account intra-urban spatial variation in risk assessment. The purpose of this effort is to evaluate a potential method to improve spatial delineation of risk from extreme heat events in urban environments by integrating sociodemographic risk factors with estimates of land surface temperature (LST) derived from thermal remote sensing data. In order to further improve the consideration of intra-urban variations in risk from extreme heat, we also developed and evaluated a number of spatial statistical techniques for downscaling the 1-km daily MODerate-resolution Imaging Spectroradiometer (MODIS) LST data to 60 m using Landsat-derived LST data, which have finer spatial but coarser temporal resolution than MODIS. In this paper, we will present these techniques, which have been demonstrated and validated for Phoenix, AZ using data from the summers of 2000-2006.